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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,989	02/06/2004	Robert K. Barr	52183	7098
7590 10/11/2005 EDWARDS & ANGELL, LLP P.O. Box 55874 Boston, MA 02205			EXAMINER ASHTON, ROSEMARY E	
			ART UNIT 1752	PAPER NUMBER
DATE MAILED: 10/11/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/773,989

Applicant(s)

BARR ET AL.

Examiner

Rosemary E. Ashton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 4-7 is/are rejected.
- 7) ☒ Claim(s) 3 and 8-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/27/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1,2,4 are rejected under 35 U.S.C. 102(e) as being anticipated by Telfer et al. patent no. 5,681,676

Telfer teaches a method comprising applying an imaging composition comprising a sensitizer to a substrate (work piece) and projecting a 3-D image onto the imaging composition so as to affect a color change in the imaging composition. As shown in the third paragraph of col. 7:

The three-dimensional imaging method of the present invention uses a radiation-sensitive layer comprise a color-forming composition adapted to undergo a change of color upon increase in the temperature of the radiation-sensitive layer above a color-forming temperature for a color-forming time. The preferred color-forming compositions described below can be caused to undergo their color change with essentially no change in dimensions of the radiation-sensitive layer. In contrast, conventional silver halide emulsions tend to shrink during development, and this shrinkage is highly disadvantageous in that it might affect registration of the composite image with the lenticles. In addition, the preferred color-forming compositions described below do not require any development steps, and thus avoid exposure of the lenticular screen to developing chemicals such as might occur if a silver halide material were used. Appropriate color-forming compositions for use in the three-dimensional imaging method of the present invention are described in, for example, U.S. Pat. Nos. 4,602,263; 4,720,449; 4,720,450; 4,745,046; 4,826,976; and 4,960,901, the disclosures of which are hereby incorporated by reference.

The imaging composition is a radiation sensitive layer comprising a color forming composition for use in the 3-D imaging method have the reagents in col. 8, lines 1-42, where b) is a colorless dye that is rendered colored by fragmentation . Telfer refers to patent no 4,720,449 to Borrer et al. which teaches the imaging composition has a compound that is colorless that undergoes a reaction that makes it colored as shown below from col. 8 of Telfer. Borrer shown the compounds are dyes and sensitize the composition to IR radiation. The composition also has a solvent that is a diluent as in claim 4 (col. 12, line 35) of the instant application.

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b. a substantially colorless di- or triarylmethane imaging compound possessing within its di- or triarylmethane structure an aryl group substituted in the ortho position to the meso carbon atom with a moiety ring-closed on the meso carbon atom to form a 5- or 6-membered ring, said moiety possessing a nitrogen atom bonded directly to said meso carbon atom and said nitrogen atom being bound to a group with a masked acyl substituent that undergoes fragmentation upon heating to liberate the acyl group for effecting intramolecular acylation of said nitrogen atom to form a new group in the ortho position that cannot bond to the meso carbon atom, whereby said di- or triarylmethane compound is rendered colored (see U.S. Pat. No. 4,720,449);

As shown in col. 14, lines 40-56 the exposure of Telfer is to infrared radiation.

FIG. 1 shows the imaging medium 10 as it is being imaged by three infra-red laser beams hv_1 , hv_2 and hv_3 , which are provided by a laser source, schematically indicated at 22, the laser beams being directed on to the radiation-sensitive layer from below the imaging medium 10 so that they do not pass through the lenticular screen 14. Simultaneously, a beam V of collimated visible radiation is directed on to the lenticular screen 14 perpendicular to the plane of the imaging medium 10. The individual lenses 16a, 16b etc. focus the beam V, thereby producing, adjacent the lower surface of the imaging medium 10, a region 24 in which the intensity of the visible radiation varies periodically in intensity across the imaging medium 10 with a period equal to the spacing between adjacent lenses 16a, 16b etc. A linear solid state imager 26 is movable within the region 24 so as to detect the periodic variation in intensity of the visible radiation within this region.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

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- to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5-7 are rejected under 35 U.S.C. 103 as being obvious over Kaufman et al. patent no. 6,547,397 in view of Telfer cited above.

Kaufman teaches a 3-D imaging method comprising applying an imaging composition to a work piece, providing a 3-D imaging system, measuring the distance between the projector and a sensor in the work piece, positioning the work piece, applying energy to the imaging composition to affect a color change. Figure 1 of Kaufman is the same as Figure 1 of the instant application. In col. 5 the elements in Figure 1 are disclosed. Figure 1 of Kaufman is the same figure as Figure 1 of the instant application.

(2) The preferred embodiment of the present invention is illustrated in FIGS. 1-23. FIG. 1 shows operator interface 10, projector 100 having the data set defining the pattern to project and reference sensors 20 positioned on the object 30. The present invention addresses the inadequacies in projection systems where the reference sensors 20 must be in a known relationship to the 3-D data set to be projected. The present invention uses an integrated laser range-finding system to accurately determine the x-y-z positions of reference sensors 20.

The x-y-z positions are the coordinate system in claim 6 of the instant application.

The range finding system determines the distance between the projector and a sensor as shown in col. 8 below. The optical signal is converted to a digital signal and analyzed by the controller module, element 210, which is the same as applying an algorithm to the results.

FIG. 8 is a schematic representation of the range-finding system of projector 100. In the preferred embodiment, the laser beam from laser emitting component 120 is passed through a -12.5 mm focal

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length collimating lens 122 to produce an 8 mm diameter laser beam. The laser beam passes through focus lens 142 having a 100 mm focal length and redirected by reflective optical elements 162 and 166 to retro-reflective surface of reference sensor 20. Focus lens 142 has an adjustment range of $\pm .2$ inches. The return beam has a diameter of greater than 8 mm and retraces the same path back through focus lens 142. At a point between focus lens 142 and collimating lens 122, adjustable reflective element 186 is placed into the return beam to the edge of the 8 mm initial beam. The return beam is directed to photo optic sensor 182 where the optical signal is converted to a digital signal and analyzed by the controller module 210.

To accurately measure the distance between the projector 100 and a reference sensor 20, the range-finding system must perform a coarse focus followed by a fine focus of the laser beam onto reference sensor 20. The initial coarse focus may be done manually or automatically. To begin distance measuring, a continuous wave laser light from light emitting component 120 is placed on or near a reference sensor 20. The imaging system software causes projector 100 to scan an area in the vicinity where the reference sensor 20 is located. A return signal is received as the laser beam crosses reference sensor 20. The midpoint of the return signal is chosen as the center from which a fine focus is next performed. To perform the fine focus, the laser beam is switched from a continuous wave light to a pulsating wave light.

As shown in Figure 1 Kaufman teaches the energy beams from the projector 100 fall on sensors 20 and on an internal triangular shape of the work piece which is not identified in Figure 1. However, because the energy beams fall on this area it would have been obvious to one of ordinary skill in the art that this area is the area to be imaged and thus must have an imaging composition thereon.

While Kaufman does not teach applying an imaging composition to a work piece (step a) and applying the 3-D image onto the imaging composition with an amount of energy to affect a color change in the imaging composition (step e) in claim 5 of the instant application. However, as shown above, Telfer discloses in col. 7 that the 3-D imaging uses a radiation sensitive layer comprising a color changing composition as shown below:

The three-dimensional imaging method of the present invention uses a radiation-sensitive layer comprise a color-forming composition adapted to undergo a change of color upon increase in the temperature of the radiation-sensitive layer above a color-forming temperature for a color-forming time. The preferred color-forming compositions described below can be caused to undergo their color change with essentially no change in dimensions of the radiation-sensitive layer. In contrast, conventional silver halide emul-

It would have been obvious to one of ordinary skill in the art to use the color changing imaging composition of Telfer for the imaging composition (radiation sensitive composition or layer) needed in the invention of Kaufman because the composition of Telfer undergoes color change with essentially no change in dimensions of the radiation sensitive layer.

Allowable Subject Matter

5. Claims 3,8-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach the dye in the imaging composition has a cyclopentanone ring as in claim 3 or the specific cyclopentanone compound in claim 8, it also does not teach the intensity of the projected 3-D image on the imaging composition as in claim 9 or the amount of energy as in claim 10.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosemary E. Ashton whose telephone number is 571-272-1326. The examiner can normally be reached on Mon-Fri, 11:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

June 11, 2005



Rosemary E. Ashton
Primary Examiner
Art Unit 1752

**ROSEMARY ASHTON
PRIMARY EXAMINER**